

Vol. III.

August, 1937

No. 8.

DISEASES

OF THE

CHEST

Official Organ of the Amer. College of Chest Physicians
Editorial offices 1018 Mills Building, El Paso, Texas
Business Address Myrtle at Virginia, El Paso, Texas

Subscription: United States and
Canada \$2.00 per year. Other
countries \$2.50 per year.

Entered as second-class matter
August 18, 1936, at the post office
at El Paso, Texas, under the Act
of August 24, 1912.

(A MONTHLY PUBLICATION)

*"The most important factor in diagnosis in
the majority of cases of pulmonary tubercu-
losis is keeping the disease in mind."*

Lawrason Brown, M. D.

Editorial Comment

NEW THE editors call attention to
FORMAT the new Format of DISEASES
OF THE CHEST starting with
this issue.

Heretofore, papers which did not oc-
cupy a full page were transferred to the
back pages of the Journal. Beginning
with this issue all papers will be published
in consecutive order until completed. This
is the accepted style of most medical
journals.

We trust that this change will simplify
the reading of papers in DISEASES OF THE
CHEST. The editors would be pleased to
receive any comments from our readers
regarding this change or any other change
which would improve the readability of
the Journal. F. W. B.

A UNIQUE THE United States of Soviet
SERVICE Russia has developed a truly
unique social service in its
fight against tuberculosis, by the develop-
ment of the *Night Sanatorium*. Such an
institution provides a place where the
worker may come after 4 o'clock when
the day's work is done and stay the night.
This is done in cases where it is not pos-
sible to secure better housing for the
family, and a sick man or woman would
have to sleep in a crowded, insanitary,
badly ventilated room.

In the *Night Sanatorium* he gets nour-
ishing food, has some quiet recreation,
and sleeps in an airy, ventilated room

even in sub-zero weather. In this way the
worker does not lose working time or
skill, his strength is built up, and his
family protected.

While the worker is at the *Night Sana-
torium* his family receives attention from
the dispensary. They go to the clinic for
observation. They receive extra diets if
necessary, and a nurse teaches them the
rules of health. The *Night Sanatorium* is
looked upon, not only as a place for treat-
ing incipient tuberculosis, but as a center
for "sanitary culture" where patients can
get health education.

Before the Revolution in Russia there
were only a few private charity clinics
in the large cities. Recently the director
of one of the *Night Sanatoria* told a rep-
resentative of the Toronto Daily Star
that while U. S. S. R. is waging a form-
idable fight against tuberculosis, the pre-
sent facilities are far from enough. This
director said "Although we have had en-
couraging results, we cannot come to
grips with the problem until we have
more doctors, nurses, rest homes, sana-
toria, and houses for the people. The third
Five-Year Plan is to provide these facili-
ties. In the mean time, because we haven't
enough beds in our sanatoria, we have
to make severe choices. We give first
choice to the worker who is the most
'socially useful,' the one who is the most
needed and valuable to his industry. With
the others, we do the best we can for them

at home.

"As a doctor, I would choose on the basis of the patient's condition, but the trade union committee makes the choices on the basis of my report. Of two workers who are equally sick, the one who is the most important to production is sent to the Sanatorium."

It is to be assumed, however, that this condition exists because of the lack of Sanatoria beds, and if the third Five-Year Plan produces sufficient beds, the Union Trade Committee would then not need to make a choice as to who was the most valuable to the industry.

The way the U. S. S. R. is meeting the situation by using the *Night Sanatorium* is not only unique, but creditable indeed.

C. M. H.

BEWARE! THE DECLINE IN TUBERCULOSIS HAS STOPPED!

Why? Opinions are numerous and varied. Several factors are important, but the outstanding one may be Collapse Therapy.

Collapse Therapy is unquestionably the greatest boon to the tuberculous patient since the universal adoption of rest treatment of the disease. BUT Collapse Therapy (whether pneumothorax, thoracoplasty, or some other form) changes many acute, previously rapidly fatal cases into chronic cases which live on indefinitely, becoming carriers of the disease, AND Collapse Therapy prolongs the life of many chronic positive sputum tuberculosis cases that it does not render sputum negative. This result has a two-fold effect: 1st: It lowers the tuberculosis death rate for a period of years. 2nd: It keeps alive carriers who would otherwise have passed away.

How to Counteract This Result?

1. Work for earlier Collapse Therapy before pleural adhesions have had time to form and strengthen sufficiently to prevent adequate collapse.

2. Work for recognition of the fact that every tuberculosis case needs not only local lung rest, but sanatorium rest to the whole mind and body, so that foci of tuberculous infection outside of the collapsed area do not act the same as the

destructive focus in the collapsed portion. It is no less than a crime against the tuberculous patient to encourage or permit him to continue with his work with only collapse therapy, and no period of sanatorium rest to wall off and heal the invisible foci which produce with great regularity, the contralateral spread in cases so handled.

3. Work for regular, periodic follow-up of the apparently-arrested case by sputum examination and x-ray to detect supposedly-cured carriers and disseminators of infection.

4. Work for isolation of the infectious case, especially from children and young adults. Emphasize the value of sanatorium training in rendering the infectious case less infectious.

5. Work for more effective Collapse Therapy. Do not be satisfied with the result unless the sputum becomes and remains negative. Both the life of the patient and his family, and public health are in danger if this result is not achieved. There is a dangerous temptation to be satisfied with gain in weight, normal temperature, normal sedimentation rate, and the like; but a sputum remaining positive can quickly abolish all of those, often too reassuring accompaniments of an insufficient collapse.

6. Work for the generous public support of all agencies actively combating tuberculosis, whether by case finding, education, or treatment of the patient with disease.

The end of this work is still quite distant. We dare not let down.

F. W. B.

KEEPING THE DISEASE IN MIND

IF ONE reviews a number of case records of Pulmonary Tuberculosis, it will be readily noted the frequency with which there occurs a history of chest colds, repeated attacks of bronchitis and pneumonia in the past life of these individuals. Is it just a coincidence; is it that they were susceptible and fell victim to all the respiratory infections that came along, including Tuberculosis; or is it because they developed

Tuberculosis after having become weakened following these repeated assaults upon their respiratory mechanism? Undoubtedly all of these play a role in some cases; but there is another very important reason that is usually not appreciated. It is that many of these chest colds, bronchitis and pneumonia episodes are in reality acute expressions of Tuberculosis itself.

This evolution of Tuberculosis has been learned by the following: increasing knowledge of the pathogenesis of tubercle; more enlightenment concerning the immunoallergic factors involved; intimate clinical observation over periods of time and by the use of serial x-ray films. This tendency for Tuberculosis to be revealed in these acute manifestations seems to be on the ascendancy and would indicate a recent trend. It probably results from progressive alterations in allergy and immunity, the relations of which are today in a somewhat debated and confused state. The initial introduction of tubercle bacilli into the body produces an allergic state to further contact with the bacilli. This allergy varies apparently in intensity in different individuals and may and does provoke the acute exudative responses noted above. We now know that the products of this exudative reaction quite often undergo resolution and absorption, in some contrast to the proliferative and productive components of the disease cycle. These acute exudative flares followed by subsequent resolution explain, therefore, these acute respiratory explosions so often erroneously diagnosed "Flu", bronchitis, etc.

The alert and wise physician will keep in mind the ever possibility of Tuberculosis in the more acute respiratory disorders, particularly when they are in any way atypical, exceptionally long drawn out or possess any suspicious features. Watch these chests carefully and make repeated sputum examinations for tubercle bacilli. You may be surprised, you will be rewarded.

C. H. H.

See Organization News on page 30.

AN OPPORTUNITY NOW

THE AMERICAN COLLEGE OF CHEST PHYSICIANS is interested as part of their accepted duty to have as many papers presented in the American Medical Association Convention at California next year, by *earlier tuberculosis diagnosis-minded men*, as possible. Therefore, we urge our members to submit to the head of the appropriate sections of the American Medical Association, titles of papers concerning chest diseases for acceptance NOW. The heads of Sections are as follows:

Practice of Medicine—Dr. Fred M. Smith, Secretary, University Hospitals, Iowa City, Iowa.

Surgery, General and Abdominal—Dr. Henry W. Cave, Secretary, 107 East 67th Street, New York, N. Y.

Obstetrics, Gynecology, and Abdominal Surgery—Dr. Norman F. Miller, Secretary, University Hospital, Ann Arbor, Michigan.

Laryngology, Otology, and Rhinology—Dr. Leroy A. Schall, Secretary, 270 Commonwealth Ave., Boston, Mass.

Pediatrics—Dr. Albert D. Kaiser, Secretary, 16 N. Goodman Street, Rochester, N. Y.

Pathology and Physiology—Dr. J. J. Moore, Secretary, 55 East Washington St., Chicago, Ill.

Nervous and Mental Diseases—Dr. Paul C. Bucy, Secretary, 950 East 59th St., Chicago, Ill.

Preventive and Industrial Medicine and Public Health—Dr. I. C. Riggins, Secretary, State Office Building, Richmond, Virginia.

Urology—Dr. William P. Herbst, Secretary, 1726 I. Street, N. W., Washington, D. C.

Orthopedic Surgery—Dr. Robert V. Funtsten, Secretary, University of Virginia Hospital, Charlottesville, Va.

Radiology—Dr. John T. Murphy, Secretary, 421 Michigan Street, Toledo, Ohio.

Committee on Scientific Exhibit—Dr. Allen H. Bunce, Chairman, Atlanta, Georgia.

Dr. Thomas G. Hull, Director, Chicago, Illinois.

F. W. B.

The Present Status of Thoracoplasty in Tuberculosis*

THE remarkable growth of thoracic surgery during the present decade has been conspicuous by the universal acceptance of surgery as an integral factor in the modern treatment of pulmonary tuberculosis, with thoracoplasty occupying an increasingly important role therein.

Lessons dearly learned through many failures and the high mortality of thoracoplasty during the struggling years of its evolution, together with the clarification of the many problems involved in collapse therapy mostly through extensive pneumothorax experiences, have resulted in the vastly improved and effective thoracoplasty of today with refinements of technic, which enable us to close a large percentage of unilateral tuberculous cavities with a surprisingly low operative mortality which compares favorably with that of other major surgical procedures.

The present trend in thoracoplasty is for the attainment of a maximum degree of selective collapse of the diseased upper portion of the lung with conservation of as much function as possible in the lower lung, when free from disease. The inadvisability of a permanently paralyzed diaphragm under such circumstances is obvious, and one should therefore maturely consider the future possible needs of collapse measures in every instance by first employing a temporary nerve interruption or crush, when phrenic surgery is seemingly indicated.

Selective thoracoplasty, by permitting the utilization of contralateral collapse procedures, has markedly advanced the scope of collapse therapy, and shows promise of rivaling the brilliant achievements of selective pneumothorax. A quite recent development in this rapidly ex-

By

WILLIAM H. THEARLE, M.D.

Albuquerque, N. M.

panding field of therapy is bilateral selective thoracoplasty for justifiable risks with advanced lesions limited

to the apical regions, viz: a four or five rib plastic on the worse side with a later apical thoracoplasty of three or four ribs on the other.

The features of paramount importance in posterior thoracoplasty, which are now considered fundamental to success, are: 1. a multiple stage operation, 2. removal of the entire first three ribs and 3. resection of the vertebral transverse processes (except the first).

It may perhaps seem a bit radical to remove these upper ribs routinely for a comparatively small cavity of the apex, but the common tendency of such cavities to drop down medially toward the hilum with recoil of the relaxed lung, after resection of only segments of the first three ribs, and the frequency of persistent cavitation after the Sauerbruch operation, have conclusively proved the necessity of an extensive type of original thoracoplasty in every case to avoid later anterolateral plastics and often reoperation posteriorly for remaining cavities, which have too frequently been attended with only partial success in the presence of a rigid thoracic wall.

The routine resection of the vertebral transverse processes with all costectomies except that of the first rib, ensures collapse in the vulnerable costovertebral gutter, which is commonly the site of cavities and almost invariably their location after inadequate thoracoplasty. Some surgeons also remove the costal cartilages with the first three ribs in an upper stage operation, which results in a complete collapse of the apex, but experience has proved this to be a little too much surgery at one time for the vast majority of patients, as is also often the entire first three ribs at one stage, because of the occurrence of excessive paradoxical mo-

*Read before the Rocky Mountain Conference on Tuberculosis at their bi-annual meeting in Albuquerque, September 29, 1936.

tion with resultant cardiorespiratory embarrassment.

Suffice it to say we cannot follow any stereotyped course of resection in our posterior stages; the character and extent of each plastic must be varied to meet the collapse necessities of each individual patient, but great care and judgment must be exercised in staging thoracoplasty in the horizontal as well as the customary vertical plane to reduce dangerous paradoxical respiration to the minimum and to accomplish adequate pulmonary relaxation with approximation of the walls of cavities at the initial thoracoplasty.

Obviously, the aim of modern thoracoplasty is the complete decostalization of that portion of the thoracic wall overlying the area of cavitation, which is commonly the upper lung field, together with the wide resection of as many additional adjacent ribs as the case in question demands.

The current trend to conservatism in the number and lengths of costectomies at each posterior stage is impressively emphasized by Haight of the Ann Arbor clinic in a recent excellent article, wherein he states: "We feel that it is dangerous to resect as much as the total lengths of three ribs at any one of the posterior stages. For this reason, in this clinic, the number of ribs resected at the upper posterior stage is now limited to two, or two and a short posterior segment of the third. The remaining antero-lateral segment of the third rib is removed at the following stage at which time, again, not more than the equivalent lengths of two or two and a half ribs are resected."

ANTERIOR thoracoplasty is required as an adjunct procedure to the posterior operation, when a complete collapse of the upper third of the lung is necessary, in patients with a large upper lobe cavity, extensive destruction of the upper lobe by cavities and tuberculous empyemata; also, for many inferior surgical risks as well as those developing excessive paradoxical motion during the upper posterior stage. Briefly, this operation consists in

the removal of the first, second and third costal cartilages (and occasionally the fourth in large empyemata), together with any remaining stumps of these ribs, preferably thru the axillary incision proposed by John Alexander.

The poor regenerative ability of cartilage usually leaves these patients with an unstable anterior thorax, which has prevented greater use of this operation. This serious objection has lately been overcome by simply dividing the second and third cartilages at their sternal junction, which permits them to hinge and swing mesially, and thus produce the desired additional collapse but with a little less anterior deformity than when these cartilages are resected.

Increasingly gratifying experiences with bilateral pneumothorax have made us less fearful of the contralateral lung, and the greater applicability of selective collapse have markedly broadened the indications for thoracoplasty. The field for surgical collapse is still the large group of chronic ulcerative phthisics with adequate vital capacity and a physical status that is equal to this extensive surgery. We no longer, however, lose valuable time waiting for the classical indications for thoracoplasty of chronic unilateral disease with sufficient fibrosis to cause retraction of adjacent structures, but do require the productive type of tuberculosis and assurance that pneumothorax has failed to control the disease.

The deadly nature of pulmonary cavities with its oft reported mortality of 85 per cent under a conservative regimen leaves us NO other alternative than the prompt consideration of collapse therapy when the stage of excavation has occurred. The magnitude of our collapse problem is glaringly reflected by recent statistics which reveal that 80 per cent of cases have cavities when tuberculosis is diagnosed, in spite of our tuberculosis campaigns and professional enlightenments in recent years; while sanatoria figures show that 85 per cent of their admissions have similarly advanced to the stage of cavitation.

Although thoracoplasty is obviously more severe and associated with greater immediate dangers than artificial pneumothorax, yet the selective type of operation, properly performed in suitable patients, possesses the decided advantage of greater fibrosis, permanent collapse and a shorter period of treatment with far greater assurances of success than is attainable with pneumothorax therapy.

Nevertheless, in spite of the shortcomings of artificial pneumothorax, viz: the long siege of treatment with its many refills, the disturbances and possible dangers associated with pleural effusions, the uncertainty as to when treatment should be terminated, and the feeling of uneasiness as to the final outcome, it remains the most valuable and applicable of all collapse measures because of its simplicity and controllable features. A routine trial of artificial pneumothorax is still orthodox before proceeding with thoracoplasty, although some now claim that in cavitation limited to the extreme apex, as well as those with large cavities, thoracoplasty is the procedure of choice as pneumothorax seldom effaces such lesions and valuable time is only lost by temporizing with it.

The most important and difficult problem in phthisical therapy at present is the management of advanced bilateral cases who comprise a large number of the patients in sanatoria, especially state and county institutions. It is surprising to note that 65 per cent of the cases in the Municipal Tuberculous institutions of New York City are so classified, many of whom unquestionably represent mistakes or neglect in treatment during an earlier period of the disease. While it is now practicable to combine advantageously various collapse procedures in bilateral therapy, yet the intelligent use of selective pneumothorax will be found the safest and most applicable of our collapse measures for this group of hopelessly advanced patients.

The situation that confronts us when bilateral thoracoplastic surgery is contemplated is a vastly different and far

more complicated one than in those with lesser involvements. The selection of such patients must be most exacting, and the greatest caution exercised in staging our procedures which must obviously be limited only to the upper lung fields. Sufficient experience has not yet accrued to justify the extreme attitude of Coryllos that no bilateral case should be considered as hopeless and unsuitable for collapse treatment as long as one lobe is still healthy.

We can but expectantly look to the future to solve properly the almost hopeless surgical problem in bilateral, far-advanced tuberculosis, through the early and judicious use of collapse therapy rather than by the resort to drastic surgery under such adverse circumstances, which can only be associated with great operative dangers, frequent complications, a very high mortality, and commonly disappointing results.

Recent reports reveal that modern thoracoplasty has so far doubled the results of our previous operations, and proportionately reduced the mortality about half. The recent trend toward expressing the results of thoracoplasty in terms of cavity closure, negative conversion of sputum, and operative mortality portrays this result far more accurately and uniformly than by the classification of cured, clinically well, improved, unimproved, and deaths. Statistics show that it is now practicable in suitable subjects to render sputum negative and close approximately 85 per cent of unilateral cavities by modern thoracoplasty when carefully and adequately staged, and with an operative mortality of less than 5 per cent. The best results so far reported are by Haight with the closure of cavities and negative sputum in 46 cases in a series of 50 (92 per cent) and with NO operative mortality.

In closing, we can but conclude from the common failure of conservative treatment in advanced pulmonary tuberculosis and the increasing general use with favorable results in recent years of collapse therapy in advanced phthisis that

the near future will witness the early and routine resort to collapse procedures in chronic tuberculosis. Further, we can only expect improvement in our results from thoracoplasty through the certification of specialists now in process which will unquestionably soon include the field of thoracic surgery, and thus eliminate

many good but busy general surgeons without fundamental training in chest work who perform thoracoplasties by the trial and error method with disappointing results, this being mostly responsible for the continued disrepute of this valuable operation in some sections of this country.

Effects of Injuries to the Thorax

INJURIES to the thorax and the underlying lung may be due to blunt force or penetration.

By
WILLARD J. DAVIES, M.D.
Rockville Centre, N. Y.

may cause hemorrhage. The bleeding is generally into the pleural cavity.

Hemothorax

Hemothorax is caused by bleeding into the pleural space. Authors differ on its treatment and its effect, but all agree that it is safer to watch it carefully. If symptoms of hemorrhage are present to a marked degree, presenting a picture of shock and exsanguination, then radical methods should be attempted. One point to be noted is that blood does not have the same power to clot within the pleural cavity as it does elsewhere.

Pneumothorax

Penetration of the chest wall to the parietal pleura or rupture of the lung through to the visceral pleura will cause a pneumothorax. The pneumothorax is usually complete. Subcutaneous emphysema is always found when the penetration extends through the chest wall and the parietal pleura. This may be, and as a rule is, simple in type. At times, a very severe subcutaneous emphysema may have to be treated by suturing the chest wall and the rent in the pleura.

The pneumothorax may be open or closed. In the open type a free egress of air from the pleural cavity can be heard. Treatment may be given either by applying a pressure bandage or by suturing, as the size of the entrance would dictate.

In the closed type, the tension pneumothorax is eminently dangerous. This is caused by a valvelike arrangement where-

Fractured Ribs

Fracture of a rib may be of the simple type with few or no complicating factors.

Again, commonly, the ragged end of a rib at the time the pressure or force is applied may tear an intercostal or a mammary vessel or the lung surface itself. The rib may spring back into shape and show no fracture or displacement on the x-ray. A small bleeder may have resulted which is not immediately discernible, and the patient may be discharged before the extent of the complicating factors has been learned. Injury may also occur to the underlying lung without fracture of the ribs.

Hemorrhage

Either type of injury mentioned above

by air enters the pleural sac and a small tab of tissue flips over the hole, preventing the gradual aspiration of the air. At each inspiration, more air will enter the pleural cavity until the pressure within becomes atmospheric. And, in proportion as one lung becomes smaller because of the compression, respirations increase. Pressure continues to pile up and, aided by coughing and straining, the tension becomes greater than atmospheric until the mediastinum and heart may be pushed to the opposite wall and asphyxia result.

Pneumothoraces following injuries should be continually checked for pressure with the regular manometer to determine whether tension is increasing; if so it should be relieved.

Empyema

A sterile effusion may easily follow pneumothorax or hemothorax. This is due to the lowering of the resistance or to irritation of the pleura.

Infected empyema are of doubtful occurrence unless the chest wall has been punctured. When they do occur, they are much more serious than the ordinary post-pneumonic empyema, because of the larger area of the pleura which will naturally be infected.

Lung Injuries

The lung may be injured by any foreign body which penetrates through the chest wall and also by blunt force. Crushing bruises may injure the underlying lung, while, owing to elasticity, the overlying ribs may not be broken. A lesion leading to the lung will cause capillary hemorrhage and edema. Laceration of the lung surface will lead to collapse, and if the area in which the tear was produced is sufficiently vascular, a hemothorax will result.

A lung abscess may develop at the site of such an ecchymosis and edema. This may be due to several causes: 1. the infection causing the abscess may have been located within the lung before the injury, but natural resistance has held it in check—such as in spirochetal abscess-

es; 2. the infection may be aspirated at the time of the impact and the ground prepared by the contusion may be a fertile field; 3. there may be a combination of the first and the second causes.

Traumatic abscess is treated as abscesses of the lung of any other origin. The prognosis in either case is poor and carries a mortality of from sixty to seventy-five per cent. Treatment depends on the location and the extent of the abscess.

Post-traumatic pneumonias occur very rarely. The physical signs and x-ray appearance are the same as in the non-traumatic type, and they are both treated the same.

A latent or healed tuberculosis may be easily activated by a superficial contusion. It can also be said that a well-known cause of tuberculosis i.e., a lowering of the systemic resistance—will be brought about by fractures and injuries to other parts of the body.

A definite tuberculous process may be present and an activation and extension take place from a breakdown or disturbance of the defense barrier which has been woven about the area.

Active tuberculosis may result in an individual formerly free from any signs of active lung involvement. The field has been prepared by the injury, and capillary ecchymosis and edema exists. A few bacilli sprayed into the field from a small, well-healed lesion find a fertile territory to grow and multiply.

Where active tuberculosis develops in an individual formerly free from the symptoms of the disease, the deduction follows that lowering of the resistance either locally or in general has given the ever-ready disease a chance for activation. Fishberg says: "Inasmuch as we may confidentially state that practically everyone has been infected with tubercle bacilli at some period of his or her life, but that in the vast majority of people this infection proves harmless, it is obvious, for medico-legal purposes, that active tuberculosis following an injury should be considered a valid cause for claims for damages when an attempt is made to determine the responsibility."

Evaluation of Phrenic Nerve Surgery in the Treatment of Pulmonary Tuberculosis *

THIS STATISTICAL study was undertaken recently for the purpose of determining, if possible, what actual service phrenic nerve surgery could render under the conditions of treatment necessary in our own department. In order to permit a fair comparison with other statistical studies a description of our facilities is pertinent. The Jackson Memorial Hospital is a general hospital, owned and operated by the City of Miami as a charity and "pay" or private institution. The Department of Tuberculosis has thirty beds for the treatment of white patients and sixteen beds for colored. Patients are usually referred through an ambulatory clinic or directly by one of the other services of the hospital. Since the bed capacity of the department is not adequate to handle all applicants, an attempt is made to make the period of hospitalization as short as possible consistent with safety to the patient and his family. Some patients are not able to arrange for suitable care outside of the hospital because of economic condition. These patients are frequently held longer than is actually necessary or are occasionally sent to a convalescent home provided they are non-contagious. The duration of hospitalization not being an actual gage of the condition of the patient, it has been omitted from this report. After discharge from the hospital, patients with any type of collapse therapy are observed in an ambulatory clinic, staffed by the same physicians who treated them during their hospitalization.

In the selection of cases for phrenic nerve surgery, each case is studied both clinically and by x-ray, frequently in conference with several members of the staff. Each of the operations in this series was

BY

M. JAY FLIPSE, M.D.,
E. C. BRUNNER, M.D.,
J. N. SNYDER, M.D.,
JAMES H. PUTMAN, M.D.
Miami, Florida

performed by the same surgeon and the request as to the type of operation originated in the medical division of the tuberculosis service. The surgeon's council and advice has, with

rare exception, approved of the type of operation requested by the attending medical staff. Follow up observation is entirely under the direction of the medical division of the tuberculosis staff.

Types of Operations

Two types of operations are used, temporary phrenic and permanent phrenic interruption. In the permanent type, the peripheral segment of the nerve is evulsed and a segment of 6 to 10 cms. usually removed. In the temporary type, the nerve is injected with alcohol and then crushed with a hemostat for a distance of 1 to 2 cms. Both operations are performed under novocaine anesthesia. As will be noted in table I (page number 15), the permanent operation was generally used in the earlier cases in our series and the temporary operation was used most frequently during the last few years.

Discussion of Indications

Practically all of our cases fall in the group of patients on whom pneumothorax has been tried and been unsuccessful, or had been thought inadvisable because of the probability of failure. In the majority of these patients the disease was bilateral and thoracoplasty was not warranted because of extensive pathology in the contralateral lung. In most instances, the rationale of the phrenic operation was to try to benefit rather than to cure the patient and possibly to prevent a spread of the disease until the contralateral lung could be improved sufficiently to warrant thoracoplasty on the side of the phrenic operation.

In some instances, phrenic surgery was used to augment the collapse obtained

*Based on the study of 85 consecutive cases on the Charity Service of the Jackson Memorial Hospital, Miami, Florida.

with partial pneumothorax. Occasionally, phrenic operation was advised because of poor cooperation on the pneumothorax program. Only rarely was it thought probable that the phrenic operation alone would be curative.

Race, Age and Sex Incidence

AGE	WHITE		COLORED	
	Male	Female	Male	Female
0 - 10	0	1	0	0
11 - 20	1	1	1	2
21 - 30	3	12	2	9
31 - 40	7	11	12	2
41 - 50	4	3	1	0
51 - 60	5	0	0	0
61 - 70	3	0	0	0
Totals	23	28	16	13
Total White	51		Colored - 29	

TABLE NO. II.

Table No. II shows the Race, Age and Sex incidence of 80 of the cases in this series. The age of the other 5 cases was not available from the records. It is interesting to note that 28.75 per cent of the phrenic operations were performed on white women from 20 to 40 years of age. This same age group in both sexes and races furnished 72.5 per cent of the cases in this series, the youngest case was 10 years and the oldest, 66 years of age.

Results

	WHITE		COLORED	
	Male	Female	Male	Female
Good	14	14	3	4
Fair	4	3	0	0
Poor	0	1	0	0
Died	4	10	6	8
Totals	22	28	9	12

TABLE NO. III.

There are only seven known survivors from the colored patients who have had

phrenic nerve operations. This constitutes one-third of the colored patients whose subsequent history is known. The average survival since operation for this group of seven is slightly less than two years, but only 2 of the 7 were operated on prior to 1935. One case has survived 59 months, but is still being treated by pneumothorax.

Among the white patients the ratio of survival is better: 36 of this group are known to be alive and 14 dead. The ratio of living to dead is 2.05 to 1 in the white group and 1 to 2 in the colored. The average survival since date of operation among the whites is 27.5 months and 13 have survived over 2 years. Five of the cases have survived over 5 years. However, all of these cases were of a far advanced bilateral nature and none are considered cured as yet. The fact of their survival is in itself significant, since none of these patients would have given a prognosis of surviving for two years without collapse procedures.

Conclusions

From the survey itself we are forced to conclude that while the procedure of phrenic nerve operation has merit, it is more useful as a secondary measure than as a procedure of choice in cases of far advanced disease. It has its place in helping to control the lesion in far advanced bilateral disease until more opportune time for major surgery, such as thoracoplasty. It has value in augmenting an incomplete pneumothorax in selected cases.

Concerning the choice of temporary and permanent phrenics, our opinion is crystalizing in favor of the temporary operation except where the degree of destruction of the lung is such as to warrant little hope of ultimate usefulness. Where the lesion is apical, a temporary phrenic has the advantage of saving some degree of usefulness for the lower lobe after an apical thoracoplasty has been performed.

Table No. 1—RESUME OF CASES.

Case No.	Age	Sex	Race	Date of Operation	Site	Indication, Lesion	Degree of Collapse	Benefits	Type of Operation	Present Condition
47374 T.W.	26	F	W	6/23/30	L	Bilateral disease, cavities.	High stand	Lived 7 yrs.	Exeresis	Expired, 1937
38499 E.L.	40	M	W	6/28/30	R	Extensive involvement of right with cavity.	Good	Slight, lived 6 mos.	Exeresis	Expired
37855 V.A.	25	F	W	6/23/30	L	Far advanced, bilateral left with apical cavity.	Fair	Lived 5 mos.	Exeresis	Expired
31790 B.S.	22	F	W	6/23/30	L	Apical cavity, bilateral disease.	Moderate	Good	Exeresis	Good
46976 C.C.	31	M	W	11/3/31	R	Extensive involvement of right failure of pneumothorax, also old empyema.	Questionable	Questionable	Exeresis	Unknown, private case
36410 T.T.	41	M	Jap.	4/7/31	L	Bilateral disease, multiple cavity with adhesions, not controlled on left by pneumo.	Good	Good	Exeresis	Good
39813 N.C.	42	F	W	1/2/31	L	Multiple cavities, adhesions, unsuccessful pneumothorax.	Good	Good	Exeresis	Good
43070 E.C.	34	F	W	12/17/31	L	Apical cavities, adhesions, pneumothorax partially collapsed.	Moderate	Good	Exeresis	Good
47831 G.L.	26	F	W	12/17/31	L	Apex involved, pneumothorax not complete.	Moderate	Good	Exeresis	Good
44211 F.H.	60	M	W	6/3/31	R	Bilateral advanced, apical cavity.	Fair	Slight	Exeresis	Expired
52151 B.M.	42	F	W	7/21/32	R	Apical cavity, bilateral disease.	Good	Good, sputum 1 plus	Exeresis	Good
39668 J.B.	17	M	W	4/21/32	R	Bilateral involvement, apical cavity.	Fair	Fair.	Exeresis	Expired
69401 W.N.	34	F	C	11/26/32	L	Possible military.	Moderate	Improved lived 1½ years	Exeresis	Expired, 4/25/35
52652 N.J.	40	M	C	9/7/32	R	Large apical cavity, pneumothorax not complete.	Fair	Improved, years	Exeresis	Unknown
51180 J.N.	40	M	C	6/10/32	R	Large apical cavity, bilateral slight disease, pneumothorax incomplete.	Slight	None, lived 2½ years	Exeresis	Expired
51482 E.F.	22	M	C	7/2/32	L	Extensive bilateral disease, more on left, pneumothorax failed, developed fluid.	Slight	Improved	Exeresis	Expired, 1937
50770 W.C.G.	26	F	C	5/23/32	L	Diffuse involvement of left lung.	Slight	Improved for short time	Exeresis	Expired, 1933
51236 C.C.	52	M	W	6/13/32	L	Extensive disease with cavity and hemorrhage.	Fair	Improved	Exeresis	Unknown
51218 A.P.	36	M	C	7/11/32	R	Cavity—hemorrhage, in hospital short period of time.	Slight	None	Exeresis	Expired, 7/17/32

Table No. 1—RESUME OF CASES—Continued.

Case No.	Age	Sex	Race	Date of Operation	Site	Indication.	Degree of Collapse	Benefits	Type of Operation	Present Condition
51094 S.R.	37	M	C	5/13/32	R	Extensive involvement, pneumothorax not complete.	Fair	Improved	Exeresis	Good
49572 S.C.	40	M	W	3/16/32	L	Bilateral disease, more on left.	Good	Good	Exeresis	Fair
70173 E.R.	28	F	W	1933	R	Bilateral disease, far advanced, one side not controlled by pneumothorax.	Moderate	Slight	Questionable	Expired, 4/21/36
49330 E.L.	24	F	W	5/20/33	L	Apical cavity, failure to close by pneumothorax.	Moderate	Good	Exeresis	Good
60255 L.M.	29	F	W	8/26/33	R	Apical cavity with adhesions.	Slight	Fair, improved	Exeresis	Good
70870 H.S.	54	M	W	10/27/33	L	Apical cavity, bilateral disease; did not care to take pneumothorax treatments.	Good	Good	Exeresis	Good
67976	24	F	W	5/ /33	?	?	?	?	Exeresis	Good
57341 M.V.	31	F	W	3/30/33	R	Apical, fibrotic, with adhesions pneumothorax not completed.	?	Improved	Exeresis	Unknown
55616 S.Y.	39	M	W	1/11/33	L	Apical cavity only information (given on chart).	?	?	Exeresis	Unknown,
81422 E.K.	37	F	W	5/20/33	L	Entire left lung cavity, adhesions not suitable for pneumothorax treatments.	Slight	Good	Exeresis	private case
59329 M.D.	25	F	W	8/26/33	R	Bilateral involvement, cavity on right, not closed completely by pneumothorax.	None	None	Exeresis	Good
59140 L.C.	26	M	W	7/ 6/33	L	Extensive involvement of left lung.	Good	Good	Exeresis	Expired
60400 G.S.	35	M	C	8/26/33	L	Caseous involvement of upper half not completely closed.	Good	Good	Exeresis	Good
82631 H.		F	W	12/ 5/34	L	Multiple apical cavities, with adhesions.	Incomplete	Little	Exeresis	Good, still takes pnx. on left, small amt. air
45856 R.P.	24	F	W	8/ 4/34	L	Bilateral far advanced, cavities with adhesions. Pneumothorax incomplete.	Moderate	Slight	Exeresis	Poor, sputum positive
75810 G.L.	45	M	W	12/ 5/34	L	Apical—far advanced.	Unknown	Unknown	Exeresis	Expired in nine mos.
69375 C.J.	43	M	W	10/16/34	L	Large, apical cavity.	Moderate	Fair	Exeresis	Unknown
68136 L.K.	35	M	W	3/ 8/35	R	Bilateral involvement, right apical cavities with adhesions, could	Good High stand.	Good	Exeresis	Unknown

Table No. 1—RESUME OF CASES—Continued.

Case No.	Age	Sex	Race	Date of Operation	Site	Indication, Lesion	Degree of Collapse	Benefits	Type of Operation	Present Condition
68136 L.K.	35	M	W	3/8/35	R	Bilateral involvement, right apical cavities with adhesions, could not take pneumothorax well.	Good High stand.	Good	Exeresis	Unknown
81799 L.P.	37	F	W	7/27/35	T	Bilateral—empyema, peritonitis, adhesions.	Slight	None	Exeresis	Good Expired, 10/6/36
46697 J.L.		M	W	9/30/35	F	Large right apical cavity, not closed by pneumothorax, pnx. on left.	Slight	Slight	Exeresis	Good, had thoraco-plasty
93436 M.M.	62	M	W	9/30/35	L	Apical cavities, not closed by pneumothorax.	Good, 3.5 cms. higher than right.	Fair, developed rt. t. b.	Exeresis	Fair, sputum still positive
80720 G.L.	42	M	C	6/8/35	R	Bilateral disease, pnx. on left.		Unknown	Exeresis	Unknown
80680 F.S.	34	M	C	7/27/35	R	Far advanced, complete consolidation adhesions. Pneumothorax not satisfactory.	Fair	Fair, lived 2 mos.	Exeresis	Expired
85024 S.H.	46	M	W	11/12/35	L		Fair	kidney, had nephrectomy	Exeresis	Fair
80059 G.H.	47	M	W	6/5/35	R	Apical cavity—pneumothorax unsuccessful.	Good paradoxical action of diaphragm	Good	Exeresis	Good
83871 M.C.	19	F	W	9/30/35		Bilateral disease, cavities, pneumothorax on left.	Slight	Fair	Exeresis	Expired
82968 R.B.	61	M	W	12/21/35	R	Apical cavity, failed to collapse by pneumothorax.	Fair	Good	Exeresis	Good
81742 C.E.	28	F	C	8/26/35	R	Progressive—bilateral pneumothorax on left.	Slight	Fair	Exeresis	Expired
80833 W.J.	25	F	C	7/27/35	L	Bilateral disease, more on left, not controlled by collapse, bilateral collapse.	Slight	Fair	Exeresis	Expired
80384 E.S.	25	F	C	7/28/35	L	Large apical cavity, bilateral involvement, failed to control by pneumothorax.	Slight	Fair	Exeresis	Expired
80259 M.W.	17	F	C	7/27/35	L	Bilateral disease, cavities failed to close under pneumothorax treatment.	?	?	Exeresis	Unknown
80551 M.S.	31	F	C	8/26/35	L	Bilateral disease, cavities and adhesions.	Fair	Good	Exeresis	Good
76064 W.E.	57	M	W	5/15/35	L	Bilateral cavities, large in left.	Fair	None, lived 6 months	Crushing	Expired

DISEASES OF THE CHEST

1937

Table No. 1—RESUME OF CASES—Continued.

Case No.	Age	Sex	Race	Date of Operation	Site	Indication, Lesion	Degree of Collapse	Benefits	Type of Operation	Present Condition
92152 F.B.	20	F	C	8/ 8/36	R	Bilateral disease with cavities. Right side not controlled by pneumothorax. Had numerous adhesions, also mastoiditis.	None	Slight	Exeresis	Expired, 10/25/36
90285 Y.W.	24	F	C	6/ 2/36	R	Bilateral disease, failure of pneumothorax on right side, successful on left.	Slight	Slight	Exeresis	Expired
86934 F.D.	24	F	W	6/ 2/36	R	Basal lesion with cavity and effusion, bilateral disease.	Slight	None	Exeresis	Expired, 6/19/36
90513 R.H.	30	F	C	6/ 2/36	R	Failure to close apical cavity by pneumothorax. Bilateral disease.	Moderate	Slight, cavity still open	Crushing	Unknown
92183 R.B.	38	M	C	7/22/36	?	Patient brought into hospital from County Hospital for one day only.	?	?	Exeresis	Unknown
92182 W.B.	23	M	C	7/22/36	?	From Dade County Hospital.	?	?	Crushing	Unknown
92185 O.M.	19	M	C	7/22/36	?	From Dade County Hospital.	?	?	Crushing	Unknown
96904 P.C.	30	F	C	5/20/36	L	Bilateral cavities more marked on left—adhesions. Pneumothorax failed.	None	Slight	Crushing	Expired, 12/24/36
92075 F.S.	35	M	C	7/22/36	R	Bilateral disease with apical cavity not controlled by pneumothorax due to adhesions.	Moderate	Improved slightly	Exeresis	Expired
92775 E.P.	38	F	W	8 11/36	R	Bilateral involvement, apical moderate cavity on right, not completely closed.	Moderate	Fair, able to work some	Crushing	Fairly good
92717 W.B.	32	M	C	8/14/36	L	Bilateral disease with cavities unable to collapse left.	Good	Improved	Exeresis	Good
91129 E.P.	38	F	W	7/ 4/36	R	Bilateral—multiple adhesions, with apical cavities.	Slight	Slight	Cut, phrenicectomy	Expired
95501 C.R.	24	F	C	11/ 7/36	R	Bilateral disease and bilateral pneumothorax, apical cavity.	Fair	Fair, cavity still remaining	Phrenicotomy	Good
93048 G.W.	40	F	W	8 10/36	R	Right lung involved with cavity, adhesions, failure of pneumothorax to close completely.	Fair	Good	Crushing	Good
94325 G.W.	33	F	W	11/ 7/36	L	Bilateral disease, adhesions on moderate good left, not controlled by pneumothorax. Right side controlled by pneumothorax. Unsuccessful pneumothorax, apical cavity.	Moderate	Good	Crushing	Good, cavity still open
96129 L.B.	35	F	W	12/10/36	R		Moderate	Good	Crushing	Good

Table No. 1—RESUME OF CASES—Continued.

Case No.	Age	Sex	Race	Date of Operation	Site	Indication. Lesion	Degree of Collapse	Benefits	Type of Operation	Present Condition
94222 L.L.	37	M	C	11/ 7/36	R	Bilateral disease with pneumothorax apical cavity, also basal lesion right side.	Slight	Fair	Crushing	Unknown
95512 H.W.	30	M	W	11/ 7 36	L	Bilateral disease, pneumothorax failed to close left apical cavity.	Moderate	Good	Crushing	Good
52271		F	W	7/26/36	R	Pneumothorax on right. Incomplete collapse adhesions to chest wall.	Fair	Improved	Exeresis	Good
95178		F	W	10/29/36	R	Apical, incomplete closure of cavities from pneumothorax.	Fair	Improved Good	Crushing Thoracoplasty, 1937	Good Fair
66589 A.K.	30	F	W	1/13/36	L	Apical cavities. Numerous adhesions, bilateral disease. Pneumothorax on left unsuccessful.	Thoracoplasty			
66799 H.S.	37	F	W	7/14/36	L	Multiple adhesions, large apical cavity.	Incomplete	Fair, still in hospital	Crushing	Fair, sputum positive
91057 W.R.	36	M	W	8/ 8 36	R	Large apical cavity, adhesions in apex, not closed by pneumothorax.	Fair	Fair, needs thoracoplasty	Crushing	Fair
85950 A.M.	52	M	W	5/20/36	R	Apical cavity with adhesions. Wassermann—4 plus.	Good	Good	Exeresis	Good
89489 L.D.	10	F	W	5/20/36	R	Far advanced, cavities, did not do well under pneumothorax.	Fair	Improved temporarily	Exeresis	Expired, 11/21/36
93023 S.W.P.	40	F	W	1936	F	Bilateral, far advanced, adhesions preventing collapse.	Moderate	Good	?	Good
90340 H.R.	37	M	C	5/19/36	R	Extensive apical involvement with adhesions.	?	?	Crushing	Unknown
88747 E.S.	42	F	W	4/ 7/36	L	Multiple apical cavities.	Slight	Good	Crushing	Good
88383 L.F.	29	F	C	3/19/36	R	Exudative type, cavities not closed by pneumothorax completely.	Moderate	Good	Exeresis	Good, sputum positive
82624 H.R.	32	M	W	1/30/36	R	Apical cavities with adhesions, failure to close with pneumothorax.	Moderate	Good	Crushing	Good
85461	24	M	W	1/13/36	R	Apical cavity, adhesions, effusion. Not closed by pneumothorax.	Moderate	Good	Crushing	Good
86267 M.W.	33	F	C	1/13/36	L	Apical cavity, adhesions, failure to control by pneumothorax.	Slight	Fair	Exeresis	Good
97300 C.S.	66	M	W	1/26/37	R	Increasing size of apical cavity. exudative lesion.	Fair	Fair, needs thoracoplasty	Crushing	Good

The Treatment of Bronchiectasis

THE CLINICAL picture of advanced bronchiectasis is usually easily recognized. The patients complain of breathlessness and fatigue, loss of weight, and obstinate expectoration of great amounts of foul smelling sputum. Physical examination may reveal clubbing of the fingers and rales in the lower lobes of both lungs. Sometimes, only x-ray study either in flat plates or after the use of lipiodol, will enable us to make a definite diagnosis. That is especially true if we think not only of the advanced, infected stages, but of the beginning ones. This disturbance must be considered in the presence of a chronic persistent cough, even in a person of good health, especially when there is a history of admixtures of some blood with the sputum and no signs of tuberculosis. In such cases we may regularly find rales on one side and always in the same area of the lower lobe. There may be a history of recurrent attacks of fever, and of—as the patient says—“frequent spells of pleurisy or pneumonia.”

The treatment, especially of the advanced cases, is not very satisfactory, an etiologic cure being relatively rare. When the bronchiectasis is due to the aspiration of a foreign body, to a luetic or tuberculous ulcer with secondary stenosis of a bronchus, or to infections of a sinus, the relief or removal of the etiologic factor is necessary for a cure. If distortion of the bronchial walls is the result of a pulmonary fibrosis, the treatment of this condition with diathermy may be tried. Arsphenamine therapy is efficacious in the presence of spirochetal infection, etc.

Besides the consideration of the etiology, it is frequently important to treat the patient as an individual rather than to consider only his disease. This is especially true in cases with hypertension, decompensated heart disease, alcoholism, gout, obesity. They may be greatly relieved by control of diet and regulation of habits. In cases of advanced bron-

BY
R. UHLMANN, M.D.
Kansas City, Mo.

chiectasis it is imperative to care for the heart, to check the production of the sputum, and to facilitate expectoration.

As in all chronic conditions, advice concerning details means very much: Careful ventilation of the room, taking short walks when no fever is present, the frequent change of position when the patient has to stay in bed, and building up resistance with cool short sponge baths—all are important.

The “thirst cure” is an excellent therapeutic measure, being frequently effective in decreasing the production of sputum. The patient is given 600 cc. fluid daily for 2 or 3 days. This is then gradually decreased to about 250 cc. (to 400 cc.) a day. One or two days a week it is advisable to give 2000 cc. fluids. In such a form the cure can be carried on for 2 or 3 months. Besides that, the patient should have a salt-poor, mixed, fairly dry diet with preference given to vegetables, salads, and fruits. The amount of starches and meat depends on the general condition: these should be restricted in cases of obesity, gout, and hepatitis; asthenic patients, however, should have sufficient nourishment (especially protein, cod liver oil, etc.). The thirst treatment is a fairly strenuous one and should not be attempted in the presence of other major disturbances such as concomitant tuberculosis, or decompensated heart disease.

Frequent bronchitis may decide the course of bronchiectasis, since patients are more susceptible to bronchitis when their tonsils have been removed. Thus bronchiectasis is a warning against unnecessary tonsillectomy. — Iodides and other expectorants, the frequent drinking of hot fluids, inhalation of tincture of benzoine compound, are helpful in stimulating expectoration.

Postural drainage is widely recommended but success with this treatment, which is frequently very inconvenient, is

chiefly obtained in certain cases in which cavities are favorably situated for drainage.

The instillation of 10 cc. of lipiodol at weekly intervals has given beneficial results, but it cannot be used indiscriminately in all cases. It is strictly contraindicated in all cases of hyperthyroidism and especially in parenchymatous tuberculosis, because it may cause a rapid spread of a fairly latent process.

The inhalation of Balsamica has been used for a long time, but its soothing action is effective only on the superficial layers of the mucous in the larger bronchi. When given by intramuscular injection, the active agent reaches the alveoli of the lungs through the blood stream. Used in this way for a long time in Europe, it is a much more efficacious solvent of the mucous secretion which lines the bronchioles and alveoli. We injected the oils of Eucalyptus, Menthol and Camphor in form of "Eucalyptol-Quinine compound," 2cc. of this substance was given daily, intramuscularly. The results have been very satisfactory. In most cases expectoration was facilitated, rales seemed to be markedly decreased after a week's administration, and the patient's feeling of tiredness was lessened. We gained the impression that this is a harmless and effective preparation, although its results are naturally limited through the pathological conditions present. A few patients complained of some soreness after the injection: the use of a long needle and of the electric pad afterwards may greatly lessen that.

Emetine hydrochloride is frequently very helpful in removing the obstructed sputum. It may be given intramuscularly every other day for 2 weeks. The dose is one-half grain which is slowly increased to one and one-half grains.

In selected severe unilateral cases a surgical procedure may be advisable when the patient is in fairly good physical condition. Especially important is the improvement of the right heart, which is so frequently weakened in bronchiectasis.

Pneumothorax, even complete, is frequently disappointing because after ending the pneumothorax the bronchioles often become wide again, restoring the old condition. The paralysis of the diaphragm by phrenicotomy helps only in early cases of the lower lobe.

Extrapleural thoracoplasty or especially extirpation of the diseased lobe gives frequently best results, but mortality is high, even in the hands of the most experienced physicians.

Summary

1. In the average case of advanced bronchiectasis, the chief purpose of treatment is checking progress of the disease, especially by preventing stagnation of sputum.
2. For this purpose Eucalyptol-Quinine compound seems to be a very helpful preparation without bad side effects.
3. In cases with much secretion, a trial with the thirst cure is very much recommended.

MEAD JOHNSON & COMPANY

EVANSVILLE, INDIANA

SUMMER DIARRHEA IN BABIES. Casec (calcium caseinate), which is almost wholly a combination of protein and calcium, offers a quickly effective method of treating all types of diarrhea, both in bottle-fed and breast-fed infants. For the former, the carbohydrate is temporarily omitted from the 24-hour formula and replaced with 8 level tablespoonfuls of Casec. Within a day or two the diarrhea will usually be arrested, and carbohydrate in the form of Dextrin-Maltose may safely be added to the formula and the Casec gradually eliminated. Three to six teaspoonfuls of a thin paste of Casec and water, given before each nursing, is well indicated for loose stools in breast-fed babies. Please send for samples to **MEAD JOHNSON & COMPANY, EVANSVILLE, INDIANA.**

The reader above is released by Mead-Johnson & Company and in no way reflects the beliefs or policies of this journal or any member of its staff.

Indications for Artificial Pneumothorax *

OUR responsibility concerning tuberculosis is twofold. Both the individual and the community must be considered. We owe the individual a return to health and well-being and a restoration to his economic status. We owe the community control of the spread of the disease by the eradication of the causative agent—the tubercle bacillus. In spite of the great strides in our knowledge of the treatment and control of tuberculosis, many people are still incapacitated and die of this disease, and its death toll is highest between the ages of 15 and 35—the years of greatest economic production.

Rest has long been recognized as the essential factor in the treatment of tuberculosis, when natural methods such as are employed in an outlined dietetic-hygienic regime fail, some form of collapse therapy is resorted to. Pneumothorax is the first consideration.

The introduction of air into the pleural cavity, or pneumothorax, as a therapeutic measure was first described by Hippocrates. In his chapter on "Diseases" he recommends it as a measure for the relief of chest pain. He says, "If the complaint was the result of a wound or following an operation for empyema a bladder was attached to a reed pipe and air blown into the pleural cavity; a probe of hollow pewter was then pushed in and closed at the end." As early as 1696, Beglivi reported chance cures of tuberculous soldiers in penetrating wounds of the chest. In 1815 Sir Thomas Young, himself a cure of the disease, in his book on "Consumptive Diseases," suggested the possibility of "bringing together the parts of a wounded lung to promote healing by the introduction of air into the pleural cavity." In 1821, Carson published the

By

NAGLA M. LAF-LOOFY, M.D.

Brooklyn, N. Y.

results of his experiments with artificial pneumothorax on rabbits. A year later a man, several members of whose family had died of tuberculosis, presented him-

self for this treatment. Carson attempted to induce pneumothorax by cutting down on the ribs but unfortunately the operation was unsuccessful due to extensive disease and numerous adhesions. It was not until 1888, some seventy years later, that Forlanini in Italy demonstrated a successful case. He had observed that a small percentage of individuals developing a spontaneous pneumothorax were extremely benefited by the accident which in the majority of cases proved fatal, and that these cases were predominantly unilateral. He argued, therefore, that the gradual collapse of the lung by the introduction of frequent small amounts of air into the pleural cavity, thereby collapsing the lung, should prove beneficial in selected cases. Murphy in Chicago independently staged a similar demonstration in 1898.

Normally, the lung is lined by a membranous sac, the pleura. One layer is adjacent to the lung—the visceral pleura. The other, to the ribs—the parietal pleura. The surfaces are slightly moist, approximate, but are not adherent unless some inflammatory condition has been present. The pleura is the lubricating membrane of respiration. Artificial pneumothorax, then, is the administration of sterile gas between the two layers of this membranous sac. A site is selected and a small hollow needle introduced between the ribs through the subcutaneous tissue, piercing the parietal pleura. Normally, there is a negative pressure of from 14 to 20 millimeters of water as compared with atmospheric pressure. A small amount of air is slowly introduced, gradually separating the two layers of the pleura compressing the lung and allowing the air

*Paper read at Meeting of Tuberculosis Sanatorium Conference of Metropolitan New York, June 10, 1936, at Municipal Sanatorium, Otisville, N. Y.

ASHEVILLE NORTH CAROLINA

"The Land of the Sky"

AMBLER HEIGHTS SANITARIUM

A modern sanitarium fully equipped for the treatment of pulmonary tuberculosis

Descriptive literature upon request

EDWINA M. RICHARDSON, R.N., SUPT.

ASHEVILLE

NORTH CAROLINA

ZEPHYR HILL SANATORIUM

For the treatment of tuberculosis and chronic diseases of the chest.

MEDICAL STAFF:

C. H. COCKE, M.D.

S. L. CROW, M.D.

J. W. HUSTON, M.D.

Mrs. W. I. ABERNETHY, R.N., SUPERINTENDENT

ASHEVILLE

NORTH CAROLINA

ST. JOSEPH SANATORIUM

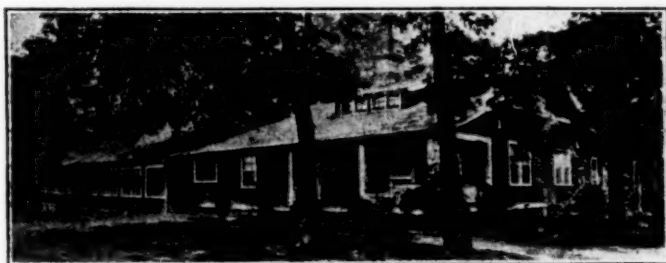
(Conducted by the Sisters of Mercy)

Fireproof, steam heat. All rooms have private sleeping porches with private or connecting baths.

Graduate nurses in attendance

ASHEVILLE

NORTH CAROLINA



VIOLET HILL SANATORIUM

Owned and operated by Mrs. Florence Barth

Each room has a sleeping porch with southern exposure. Free automobile transportation to Town

ASHEVILLE

Reasonable Rates

NORTH CAROLINA

PORTLAND OPEN AIR SANATORIUM

MILWAUKIE, OREGON

A thoroughly equipped institution for the modern medical and surgical treatment of tuberculosis. An especially constructed unit for thoracic surgery. The most recent advances in pneumolysis applied to those cases demanding this branch of intrathoracic surgery.

MODERATE RATES

Descriptive Booklet on Request

Medical Directors: } Ralph C. Matson, M.D., and Marr Bisaillon, M.D.
1004 Stevens Building Portland, Oregon

GRACE LUTHERAN SANATORIUM FOR TUBERCULOSIS

701 SOUTH ZARZAMORA STREET

SAN ANTONIO, TEXAS

Admits patients irrespective of denomination or creed. Ideal all year climate...Excellent medical and nursing care.

"Radiographic, Fluoroscopic, and Pneumothorax service." New, distinctive, **Individual Bungalows...** highly modern; also Private Rooms with baths and sleeping porches...all equipped with radio... Beautiful grounds...**Moderate Rates.**

For booklet and information address.....PAUL F. HEIN, D.D., Pastor & Sup't.

HOLY CROSS SANATORIUM (NON SECTARIAN) In the Health Zone of the Nation

A large, modern, privately owned, 250 bed Institution, comprising 500 acres, with Truck Garden, Poultry and Dairy Farms. Well balanced menus.

A "Home away from Home," with each Room and Ward adjoining a private, airy sleeping porch. Also private rooms with bath.

A beautiful, restful Health Resort, with separate Units personally supervised, and having every Medical aid and wholesome entertainment. X-ray and Clinical Laboratory work, Artificial Pneumothorax, Heliotherapy and Ultra Violet Ray. Competent medical and nursing staff. Radio, Microphone with ear-phone connections to each bed.

Located in the Health Zone of the nation with ideal year-round climate. Altitude 4,330 feet. Water 99.99 per cent pure.

RATES \$15.00 to \$22.50 A WEEK

SISTERS OF THE HOLY CROSS, Supervisors

" "

HOLY CROSS, NEW MEXICO

in the alveoli to escape through the bronchial tree. This procedure is repeated at intervals until the desired clinical results are obtained—absence of constitutional symptoms and a persistently negative sputum. After that, refills are given at intervals depending on the rate of absorption of the air in the pleural sac.

The effect of this procedure is twofold: mechanical and physiological. Mechanically, as the pressure in the pleural cavity is increased, excess secretion is gradually expressed from the lung, thereby preventing the extension of the tuberculous process along the lymphatics and through the bronchial channels. The pre-existing tendency of the lung to shrink due to the presence of contracting scar tissue is augmented. If cavities are present, their walls are approximated and gradually knit together, resulting in obliteration of the cavity and scar tissue replacement. Physiologically, respiratory excursions are diminished and finally abolished. A condition of stasis and hyperemia ensues. The circulation of lymph is diminished, resulting in a limitation and demarcation of the affected areas and the proliferation of connective tissue. An exudative process is thereby converted into a proliferative one. It is not always necessary to produce a complete collapse of the diseased lung. By an effective collapse we mean one which results in a loss of constitutional symptoms and in a repeatedly negative sputum. This may be produced by a collapse of the diseased portion of the lung only, as in selective pneumothorax; a complete collapse of the lung in cases where the disease involves the whole lung; or a compression pneumothorax, air introduced under high pressure to close resistant cavities.

In about 50 per cent of the cases in which pneumothorax is attempted, the procedure proves unsuccessful because of adhesions which either completely obliterate the pleural space or which may be so situated as to interfere with an effective collapse. Other collapse measures must then be resorted to such as oleotho-

rax, intrapleural pneumolysis, phrenic nerve interruption, apicolysis, or thoracoplasty. When pneumothorax was first introduced, unilateral cases only were chosen. It was believed that disease of the opposite lung was a distinct contra-indication. Gradually, however, during the past ten years, influenced largely by our French confreres, we have become less timid in the more widespread application of this procedure. I may safely say that practically the only contra-indication at present is the mechanical one due to the presence of obstructing adhesions.

Pneumothorax should be attempted when after a period of six to eight weeks of strict absolute bed rest a patient shows progression or no retrogression. If the case is bilateral, the side showing the more extensive disease is collapsed first. Experience has shown that the opposite lung usually heals spontaneously when an effective collapse is obtained on the side more affected. If this is not the case, some suitable form of collapse therapy is done on that side also.

In acute exudative cases, those presenting a rapidly spreading type of disease, pneumothorax should be attempted. If this is not done immediately, valuable time may be lost and the disease spread to involve healthy lung tissue. At best, the prognosis in these cases is poor and if left alone will end fatally. A cautiously induced pneumothorax may help check the process.

In cavity cases, single or multiple, surrounded by a considerable amount of exudation and scattered disease throughout the lung, there is very little possibility of closing the cavity or arresting the disease without some form of compression therapy. Experience has shown that bed rest alone will not arrest such a condition.

Cases of fibroid tuberculosis with cavitation and persistent positive sputum, though presenting no constitutional symptoms, should be collapsed if possible. These are the carriers whose tuberculosis is of no danger to themselves but who are a menace to the community because they

SARANAC LAKE

NEW YORK

"In the heart of the Adirondack State Park"

Friends to the Tuberculous

COLLINS & LOW

NURSING COTTAGE

7 Front Street

Rooms with porches—modern conveniences—tray service—home cooking—reasonable rates.

MC BEAN COTTAGE

89 Park Avenue

Located in the most desirable section of Saranac Lake—facilities for any type of accommodations.

Mrs. C. M. McBean, Prop.

FALLON COTTAGE

33 Franklin Avenue

Located in a desirable section of Saranac Lake
Modern accommodations at reasonable rates
Homelike atmosphere.

Mrs. Anna Fallon, Proprietor

NOYES COTTAGE

16 Helen Street

All rooms with sleeping porches, with and without private baths—good location—home-cooking
Individual diets.

Miss Cathryn A. Noyes, Prop.

FRANKLIN MANOR

68 Franklin Avenue

A private sanatorium for tuberculous patients requiring nursing care—excellent location—special attention to diets—rates upon request.

M. Camilla Hayes Hudson, R. N., Supt.

TULLY COTTAGE

164 Broadway

A homelike cottage for the care of tuberculous patients—home cooking—pleasant environment—close in to town—moderate rates.

Mrs. Frances Tully, Prop.

GONZALES COTTAGE

80 Park Avenue

Nursing and ambulatory suites—rooms and porches, with or without private baths—Spanish and American cooking.

Mr. & Mrs. Alfredo Gonzalez, Mgrs.

WARSCHAUER COTTAGE

64 Park Avenue

A small private sanatorium, where a patient can secure individual care and excellent food—moderate rates.

Mrs. Edna K. Warschauer, Mgr.

LYNCH COTTAGE

88 Riverside Drive

On the Lake—Facing the Mountains—Rooms and porches; some with private baths—nursing service—rates reasonable.

Katherine C. Lynch, R. N., Prop.

WERLE COTTAGES

110 Main Street

Close to town—residential district—all modern conveniences—rooms with and without private baths—moderate rates.

Aletta Werle, Prop.

HOEBLING NURSING COTTAGES

26-28 Front Street

Rooms and porches with and without private baths and running water—special diets when required—graduate nurses—rates upon application.

Mr. and Mrs. H. Hoebling, Props.

SAGEMAN NURSING COTTAGE

32 Park Avenue

A comfortable home for the tuberculous—rooms with and without sleeping porches—graduate nurses in attendance at all times.

Mrs. George C. Sageman, Prop.

are constantly shedding bacilli.

In cases of pleurisy with effusion with the patient running a stormy course and rapidly accumulating fluid, persistent high temperature, rapid pulse, dyspnea and cyanosis, fluid should be aspirated and replaced with air. The pneumothorax should then be maintained if disease is present in the underlying lung.

Pneumothorax is sometimes induced to control hemorrhage if it can be determined from which side the hemorrhage is coming. If an x-ray is taken and the disease is predominantly unilateral or shows unilateral cavitation, then that side should be collapsed.

When complications are present such as tuberculous laryngitis or enteritis, pneumothorax is particularly indicated. These conditions are due to direct surface contact of the organism as in expectorating and swallowing sputum loaded with bacilli. It is conceivable, then, that with shutting down of the source of supply of the tubercle bacilli and proper rest, healing will occur.

In the presence of a co-existing diabetes or pregnancy, collapse therapy should be resorted to, if possible. Tuberculous diabetics present an exudative and rapidly progressing type of disease. It has been the general impression that pregnancy has a deleterious effect on tuberculous mothers. They do well during the pregnancy itself because of the increased intra-abdominal pressure which, by elevating the diaphragm, produces a reduction in the size of the thoracic cage. After delivery, there is a sudden release of this pressure and a terrific load is put on a diseased lung resulting in active tuberculosis. If this is controlled with pneumothorax, the danger is avoided.

In cases of spontaneous pneumothorax or rupture of the lung, a collapse should be maintained if tuberculous pathology in the underlying lung can be demonstrated.

Children with a secondary type of infection and the Colored Race have little resistance against tuberculosis and present a rapidly spreading type of disease.

Pneumothorax should be attempted immediately.

Pneumothorax has been advocated in the treatment of bronchiectasis and lung abscess, but in these conditions this procedure is not without hazard. In suppurative disease of the lung, our object is to increase circulation and institute measures which favor drainage. Pneumothorax would produce a stasis and might exert pressure interfering with drainage. If the abscess or bronchiectatic cavities were centrally located near the hilus, this procedure may be of benefit, but the risk is not commensurate with the results obtained.

Lately, pneumothorax has been advocated in the treatment of lobar pneumonia. Pneumothorax seems to help only if used within the first 72 hours and before the appearance of consolidation, if no adhesions are present and if a complete collapse is obtained. Since the majority of cases are not seen until after the third day, the practicability of this method is limited and no better results are obtained than by serum therapy. The arguments used against this measure for bronchiectasis and lung abscess may also be applied here. Added to these, is the danger of producing a fulminant empyema.

Pneumothorax may also be used as a diagnostic measure in the differential diagnosis of diseases of the lung, pleura and mediastinum. Especially is it of benefit in localizing new growths for surgical approach.

Pneumothorax is not without its hazards. The most frequent complication is effusion. This fluid is usually simple, serous, varying in amount from a few drops in the costophrenic sulcus to a whole chest full. In the majority of cases it is reabsorbed, causing no constitutional symptoms. If temperature, rapid pulse, or dyspnea develop and persist for any length of time, it is advisable to aspirate and replace with air. About 2 per cent of the cases develop a tuberculous empyema which may require no treatment at all or

Palmer Sanatorium

SPRINGFIELD
ILLINOIS

A Private Sanatorium of the Highest Class. Very moderate inclusive rates with no extra charges. Fully approved by the American College of Surgeons. Unusual refinements of service. New and modern buildings and equipment.

A CONVALESCENT SECTION for non-tuberculous convalescents.
Circulars on request: **DR. GEORGE THOMAS PALMER**, Medical Director.

LAUREL BEACH SANATORIUM

SEATTLE

(On the Salt Water Beach)

WASHINGTON

A private sanatorium fully equipped for the modern treatment of Chest Diseases. . . X-Ray, Fluoroscope, Pneumothorax, Phrenectomy and Thoracoplasty. . . Special diets when required; private and semi-private rooms. Rates: From \$25.00 per week up, including medical care.

FREDERICK SLYFIELD, M.D.

JOHN E. NELSON, M.D.

RAYMOND E. TENNANT, M.D.

ST. LUKE'S HOME

SPECIALIZING IN THE ACTIVE TREATMENT OF TUBERCULOSIS

Phoenix, Arizona, altitude 1100 feet—October to June.

Prescott, Arizona, altitude 5300 feet—June to October.

A highly favorable climatic arrangement.

REV. B. R. COCKS.....Managing Director

E. W. PHILLIPS, M.D., F.A.C.P.....Medical Director

SOUTHERN SIERRAS SANATORIUM

BANNING, CALIFORNIA



Location, near but not directly on the desert (altitude 2,400) combines best elements of desert and mountain climates. . . A sustained reputation for satisfaction, both among physicians and patients. . . Send your next patient here, and you may be assured of his receiving maximum benefit, and of his full gratitude.

C. E. ATKINSON, M.D. MEDICAL DIRECTOR

MARYKNOLL SANATORIUM

MONROVIA

(Maryknoll Sisters)

CALIFORNIA

A sanatorium for the treatment of tuberculosis and other diseases of the lungs. Located in the foothills of the Sierra Madre Mountains. Southern exposure. Accommodations are private, modern and comfortable. General care of patient is conducive to mental and physical well being.

Sister Mary Edward, Superintendent

E. W. Hayes, M.D., Medical Director

ST. VINCENT SANATORIUM

SANTA FE
NEW MEXICO

Information
and Rates
on Request

TUBERCULOSIS IN ALL FORMS

ROBERT O. BROWN, M.D.

MEDICAL DIRECTOR

Conducted by
SISTERS OF
CHARITY

THIRTY-FIVE YEARS OF UNRIVALED SERVICE FOR THE SICK HAVE MADE

St. Joseph Sanatorium and Hospital

ALBUQUERQUE, NEW MEXICO

The Most Beloved and Famous Institution of the Southwest

A 200 K.V.P. SHOCK-PROOF DEEP THERAPY MACHINE HAS RECENTLY BEEN INSTALLED

may necessitate irrigation and replacement with oil. In Oleothorax sterile mineral oil is used, with or without gumenol, acting as a mechanical deterrent for the reaccumulation of the pus. A still smaller percentage of the cases develop a mixed tuberculous and pyogenic empyema. These patients are desperately ill and saline irrigations should be resorted to daily. I have tried numerous antiseptics—the dyes, mercurials, and Azo-Chloramid, but my experience has been that simple saline is less irritating and more efficacious in controlling the pleural infection. After the irrigation, 300 to 400 cc. of saline is allowed to remain in the pleural cavity and this acts as a wet dressing to the inflamed surfaces of the pleura. After the temperature subsides, if a broncho-pleural fistula is present, thoracoplasty must be done to obliterate the pleural space and permanently collapse the lung. If this is not present, then the pyo-pneumothorax is converted into an Oleothorax.

Spontaneous pneumothorax may develop in the course of an induced pneumothorax due to the tearing of an adhesion, causing a rupture of the lung, or an erosion of the diseased process through the pleura. The break may seal over and cause little damage, or may remain open, resulting in a broncho-pleural fistula and a mixed-infection empyema.

Patients may die very suddenly during

the administration of air or as the needle is being introduced. This phenomenon has been called pleural shock and very little is known of its mechanism. Nothing is usually found pathologically to account for the fatality. In elderly people with arteriosclerosis and coronary disease, death may be traced to a coronary thrombosis.

Some cases of pneumothorax develop transitory hemiplegias and other neurological signs. These may come on during or immediately after the administration of air, last a few minutes to a few days, and gradually disappear; or the patient may die on the table during the attack. This is due to air embolism, sufficient air being introduced into the vascular system to cause death.

Subcutaneous emphysema often develops at the site of injection but the air is quickly absorbed. It may, however, extend to involve the entire body and may be fatal.

Artificial pneumothorax has been the outstanding single contribution to the treatment of pulmonary tuberculosis in the last 50 years. Though apparently a very simple procedure, it is not without great danger and should not be attempted except by those who have had ample experience in its technique and in the management of pulmonary tuberculosis.

"Reading Time of Papers published in Diseases of The Chest — 5 to 15 minutes."

BROWNS MILLS - In The Pines

NEW JERSEY

80 miles from New York City; 32 miles from Philadelphia; 3 miles from Camp Dix—Ideally located for patients with respiratory diseases.

Manor Nursing Cottage

Equipped with X-ray and Fluoroscope; Pneumothorax.

Lillian E. Hutchings, Owner

Browns Mills Nursing Cottage Sycamore Hall Sanatorium

Incorporated

Excellent Medical and Affiliated Surgical Treatment for Tuberculous patients. Well Known For Home-Like Environment and Excellent Food.

Equipped with every modern convenience.

MARCUS W. NEWCOMB, M.D., Medical Director

The Pottenger Sanatorium and Clinic

Write for particulars

THE POTTENGER SANATORIUM AND CLINIC

MONROVIA, CALIFORNIA

For the diagnosis and treatment of diseases of the lungs and pleura; asthma and other allergic diseases; asthenics and others who require rest and supervised medical care An ideal all-year location. The grounds surrounding the Sanatorium are beautifully parked and add much to the contentment and happiness of patients.

Close medical supervision. Rates reasonable.

F. M. POTTENGER, M.D.	Medical Director
J. E. POTTENGER, M.D.	Asst. Medical Director and Chief of Laboratory
LEROY T. PETERSEN, M.D.	Asst. Physician and Roentgenologist
F. M. POTTENGER, JR., M.D.	Assistant Physician

ROCKY GLEN SANATORIUM

McCONNELLSVILLE, OHIO

FOR THE MEDICAL AND SURGICAL
TREATMENT OF TUBERCULOSIS

DR. LOUIS MARK, MEDICAL DIRECTOR
677 N. High St., Columbus, Ohio

H. A. PHILLIPS
Superintendent

DR. D. G. RALSTON
Resident Med. Director

DR. A. A. TOMBAUGH
Resident Physician

Graduate Nurses



Where the science of treatment is first.

Beautiful Surroundings

Reasonable Rates

BARFIELD SANATORIUM

In the Delightful Sunshine of Tucson, Arizona

EXCELLENT ACCOMMODATIONS

KARL BARFIELD
Managing Owner

SAMUEL H. WATSON, M.D.
Medical Director

METHODIST SANATORIUM

ALBUQUERQUE, NEW MEXICO

A modern sanatorium for the Tuberculous — Four large modern well-equipped buildings and fifty cottages surrounded by beautiful lawns and trees — Open to all physicians — Rates \$50.00 to \$75.00 per month — medical care extra.

MRS. MINNIE G. GORRELL, Superintendent

VON ORMY COTTAGE SANATORIUM

VON ORMY, TEXAS

FRANK C. COOL, President
R. G. McCORKLE, M.D., Med. Dir.
W. R. GASTON, Manager

An institution designed for the proper treatment of tuberculosis patients at moderate rates. Beautifully located on the Medina River near San Antonio, Texas. Splendid all year 'round climate. Our own dairy and egg supply. Artificial pneumothorax used where indicated. Hopeless last stage cases not admitted. Weekly rates \$15.00, \$17.50, and \$22.50. For booklet please write the manager.

ORGANIZATION NEWS

Scientific Exhibit, Atlantic City Meeting.

A splendid educational exhibit was arranged in the Section on Scientific Exhibits by Dr. William Devitt, Past-president of the Federation of American Sanatoria (now the American College of Chest Physicians), at the Atlantic City meeting of the American Medical Association, June 7-11.

The exhibit consisted of a group of posters with large lettering calling the attention of the "Family Doctor" to the important factors to be sought in the diagnosis of early Tuberculosis. Of all the methods used in diagnosis, the x-ray was shown to be the most potent factor in the discovery of early Tuberculosis.

Two view boxes were displayed, the one showing a picture of a normal, healthy young man, whose physical diagnosis was *negative*; and the other showed his x-ray plate which clearly indicated an *advanced* case of Tuberculosis. This was displayed to bring to the attention of the physician that the x-ray is indispensable in the diagnosis of early Tuberculosis.

Several thousand physicians stopped at the booth during the week that the exhibit was in place. They expressed a deep interest in the educational value of the exhibit and in the program of the American College of Chest Physicians. Several hundred physicians requested literature. Copies of DISEASES OF THE CHEST and other data published by the Society will be mailed to them.

The American College of Chest Physicians solicits ideas and suggestions from the members of the Society and from the readers of DISEASES OF THE CHEST, to be used for an exhibit in the Scientific Section of the A. M. A. meeting to be held next year at San Francisco. Please send suggestions to Dr. A. J. Cohen, Chairman of the Committee on Education, 1630 Spruce St., Philadelphia, Penna.

Dr. Devitt has arranged to box the exhibit, which was shown at Atlantic City, so that it

can be shipped to any part of the United States or Canada. Physicians desiring to use same in connection with State or County meetings will please write to Dr. William Devitt, Medical Director, Devitt's Camp, Allenwood, Penna. Kindly make your request as far in advance of the meeting dates as possible, so that suitable arrangements can be made and the exhibit reserved for your meeting.

Change of Status for Membership.

At the annual meeting of the Federation of American Sanatoria held at Atlantic City, a resolution was adopted changing the name of the Society from the Federation of American Sanatoria to the American College of Chest Physicians. The new name is more in keeping with the present membership of the Society as many of the members are not affiliated with Sanatoria but do specialize in the practice of chest diseases. Under the former by-laws, membership in the Society was limited to physicians in the private practice of medicine, either full or part time, and to those connected with private sanatoria. The new amendment opens the membership to all qualified physicians, who are in good standing with their medical societies and who can meet the requirements of the Board of Regents of the American College of Chest Physicians. Application blanks for membership are now being prepared and the Board of Regents will be pleased to mail a copy upon request, to any physician who feels that he is qualified to become a Fellow of the American College of Chest Physicians.

The 1937 Pneumothorax Directory which lists those members of the American College of Chest Physicians who are qualified and equipped to administer Pneumothorax is now being prepared for the press and it is expected that same will be ready for distribution by August 25th.

DOCTOR: SEND YOUR NEXT PATIENT TO THE

NORUMBEGA SANATORIUM

MONROVIA — CALIFORNIA

A modern 18 bed sanatorium with a double suite of rooms for each patient; beautifully situated in the foothills of the Sierra Madre mountains.

FRANK PORTER MILLER, M.D., Medical Director

Southwestern Presbyterian Sanatorium

ALBUQUERQUE,
NEW MEXICO

A well-equipped Sanatorium in the Heart of the
Well Country.

Write For Information and Rates.

